

# Rock and Roll Mania



## Standard: 3240-03

Students will relate forces and energy to motion.

## Objective: 3240-0302

The student will identify the role of energy in motion.

## Objective: 3240-0303

Analyze energy movement and transformation.

## Intended Learning Outcomes:

- 1a. Make observations and measurements (uses instruments as appropriate).
- 2a. Identify variables and describe relationships between them.
- 2c. Plan field studies, controlled experiments, and other investigations.
- 4b. Understand how technological advances have influenced the progress of science, and how science has influenced developments in technology.
- 4d. Recognize the personal relevance of science in daily life.

This is a great activity to teach about energy conversion from Kinetic to Potential energy and back again. Using the materials provided, build a working roller coaster with all the required components. Students must demo their team's coaster to the class and draw their individual blue prints of their ride. This activity is worth 60 pts.

## Materials (per team)

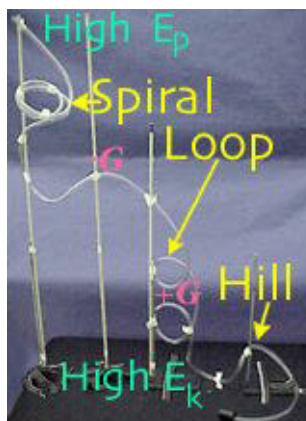
- 1 - 15 foot polyvinyl tube 1/2" dia. 3 - Ring Stands w/ 48" dowel
- 1 - roll of masking tape 3/4" wide 1 - Film Canister
- 2 - Steel bearing (must fit in tube easily)

## Requirements

1. Name your roller coaster. (5 pts.)
2. Each roller coaster must have the following components -
  - \* Two loops (10 pts.)
  - \* Two true hills (10 pts.)
  - \* One corkscrew or twist (10 pts.)
  - \* Extra credit: Double flat spiral (10 pts.)
3. Each roller coaster must be drawn-up like a blue print. (20 pts.)
4. Included on the drawing: The following must be included on all hills, twists and loops.
  - \* Highest Potential Energy (Hi  $E_p$ )
  - \* Lowest Potential Energy (Lo  $E_p$ )
  - \* Highest Kinetic Energy (Hi  $E_k$ )
  - \* Lowest Kinetic Energy (Lo  $E_k$ )
  - \* Where rider would feel weightless. (-G)
  - \* Where the forces of gravity is greater than one. (+G)

## Background

Form a group of three to four students. Allow the students to place their ring stands on the desk or tables. Set the maximum height a ride may begin. Do not allow them to begin the ride any higher because this will give an unfair advantage by allowing them greater potential energy at the start. Have the students tape the film canister to the end of the tube to prevent the loss of the steel bearing after rolling it through the



tube. Have fun with this activity.

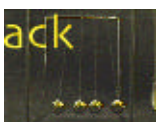
### Conclusion

1. Demonstrate your ride by:
  - a. Stating the rides name.
  - b. Identifying the components of the ride (hills, twists,&;loops)
  - c. Identifying the impact of forces on the ride (Ep, Ek, -G, +G)
  - d. Successfully completing the ride with your steel bearing.

### Safety:

There are no safety concerns with this activity.

To learn more about rollercoasters, visit [Rollercoaster.com](http://Rollercoaster.com). Remember that you will need to use your browser's "back" button to return to Sci-ber Text!



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Updated August 7, 2000 by: [Glen Westbrook](#)

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